Missouri Department of Natural Resources

Total Maximum Daily Load Information Sheet

Turkey Creek

Waterbody Segment at a Glance:

County: St. Francois
Nearby Cities: Bonne Terre
Length of impairment: 2 miles
Pollutants: Biochemical Oxygen Demand (BOD)
Volatile Suspended Solids (VSS)
Source: Bonne Terre Wastewater Treatment Plant


State map showing location of watershed

TMDL Priority Ranking: Low

Description of the Problem

Beneficial uses of Turkey Creek

- Livestock and Wildlife Watering
- Protection of Warm Water Aquatic Life and Human Health associated with Fish Consumption.

Use that is impaired

- Protection of Warm Water Aquatic Life

Standards that apply

- The Missouri Water Quality Standard (WQS), found in 10 CSR 20-7.031 Table A, for dissolved oxygen (related to Biochemical Oxygen Demand, or BOD) in streams is 5.0 mg/L (milligrams per liter or parts per million).
- The standards for volatile suspended solids (VSS) may be found in the general criteria section of the WQS at 10 CSR 20-7.031(3)(A) and (C). Here it states:
  - Waters shall be free from substances in sufficient amounts to cause the formation of putrescent, unsightly or harmful bottom deposits or prevent full maintenance of beneficial uses.
  - Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses.

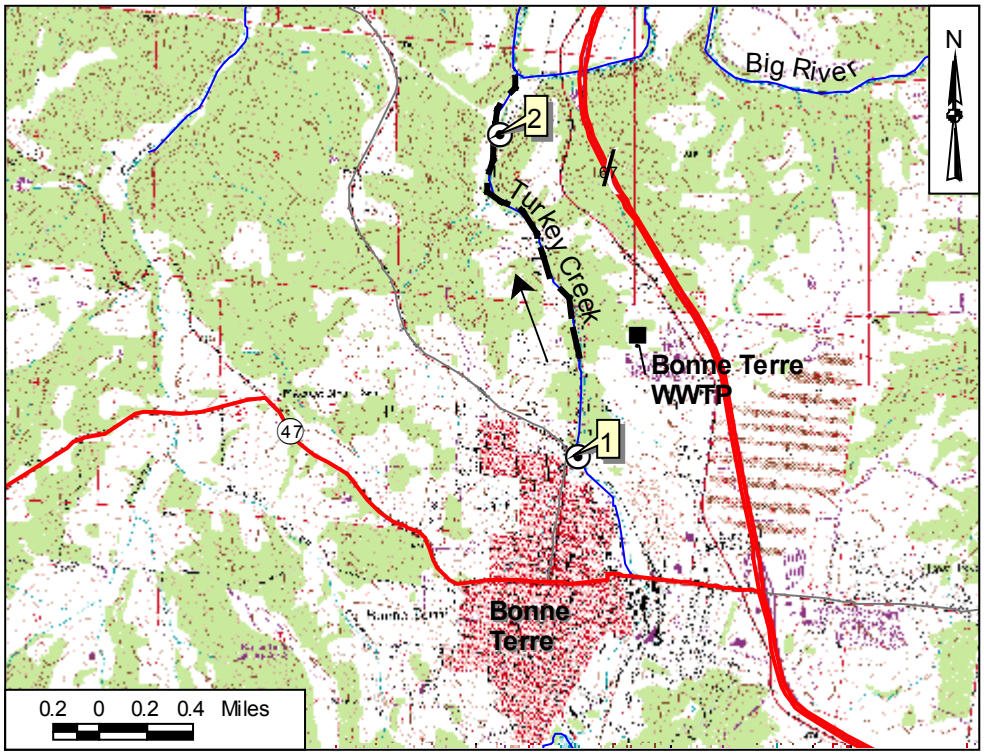
Any waterbody that was listed for Non-Filterable Residue (NFR) in 1998 is now being listed as Volatile Suspended Solids (VSS). VSS are organic solids coming from wastewater treatment plants. The new listing gives a clearer picture of the specific pollutants affecting the water.

The Missouri Department of Natural Resources (the department) has performed visual examination and sampling of the kinds of aquatic invertebrates (like water insects and crayfish) in Turkey Creek. These results show reduced diversity of aquatic invertebrate animals downstream from the Bonne Terre wastewater treatment plant (WWTP) and a lead mill tailings pile. The department is now conducting monitoring on Turkey Creek to determine the apparent impact of each of these two sources on the stream.

Wastewater high in Biochemical Oxygen Demand (BOD) reduces the amount of dissolved oxygen in the stream's water. Most aquatic organisms require high levels of oxygen to survive. In addition, volatile suspended solids (VSS), also known as suspended solids, can settle onto the bottom of a stream smothering natural substrates (materials in the streambed), aquatic invertebrate animals and fish eggs. Like all wastewater discharges in Missouri, the Bonne Terre WWTP has to meet the requirements of a discharge permit issued by the department.

The scheduled monitoring should determine whether the tailings pile is polluting the stream with metals. The data table below contains the results from the 2001 testing for metals.

Turkey Creek in St. Francois County, Missouri, Showing Sampling Sites



Impaired Segment → Direction of flow

Site Index

1 – Turkey Creek downstream of tailings and upstream of Bonne Terre WWTP

2 – Turkey Creek downstream of tailings and downstream of Bonne Terre WWTP

Sample analyses from Turkey Creek, June 28, 2001

Parameter	Site #1	Site #2
Flow (cu ft/sec)	0.1	1.6
Temperature (^{o}C)	20	20
pH	7.5	8.3
Specific Conductivity (µmhos/cm)	458	880
Dissolved Iron (µg/L)	<2.5	7.7
Dissolved Cadmium (µg/L)	2.68	<0.5
Dissolved Copper (µg/L)	11.3	<5
Dissolved Nickel (µg/L)	55.4	8.8
Dissolved Lead (µg/L)	42.4	7.6
Dissolved Zinc (µg/L)	246	20.6

Source: Missouri Department of Natural Resources

For more information call or write:

Missouri Department of Natural Resources
Water Pollution Control Program
P.O. Box 176, Jefferson City, MO 65102-0176
1-800-361-4827 or (573) 751-1300 office
(573) 751-9396 fax
Program Home Page: www.dnr.state.mo.us/wpscd/wpcp/index.html